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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/708,723

03/19/2004

Ehud J. Schmidt

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ZIOLKOWSKI PATENT SOLUTIONS GROUP, SC (GEMS)

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EXAMINER

WEATHERBY, ELLSWORTH

ART UNIT

PAPER NUMBER

3768

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

02/12/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/708,723

Applicant(s)

SCHMIDT, EHUD J.

Examiner

Ellsworth Weatherby

Art Unit

3768

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>4/13/2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1 and 4-14, are rejected under 35 U.S.C. 102(b) as being anticipated by Atalar et al. (U.S. Patent No. 6,628,980).

Atalar et al. '980 teaches a probe for acquiring data in magnetic resonance imaging, the probe comprising: a self-expanding housing insertable into a subject to be imaged and constructed to permit fluid flow therethrough (col. 3, lines 55-67; col. 4, lines 1-5; col. 19, lines 50-56); and a plurality RF coils attached to the housing (col. 6, lines 55-60). Atalar et al. '980 also teaches that the device is constructed to be insertable into a vascular system of the subject to be imaged (col. 19, lines 50-56). Atalar et al. '980 also teaches that the device further comprises at least one tuning capacitor connected to the plurality RF coils, the at least one tuning capacitor configured to tune the plurality RF coils (col. 17, lines 40-44). Atalar et al. '980 further teaches a shaft connected to the housing and constructed to position the housing within the subject to be imaged (col. 4, lines 40-43). Atalar et al. '980 also teaches a retractable sheath constructed to enclose the housing during insertion into the subject and translation to a target tissue to be

imaged and further constructed to be retracted by a user to allow the housing to expand when proximity to the target tissue is reached (col. 16, lines 29-31). Atalar et al. '980 also teaches that the sheath is constructed to enclose the housing during insertion into the subject and translation to a target tissue to be imaged and further constructed to be retracted by a user to allow the housing to expand when proximity to the target tissue is reached (col. 15, lines 66-67; col. 16, 1-11; col. 16, lines 29-31). Atalar et al. '980 also teaches that the sheath is formed of a material that applies a compression force upon the housing and the plurality RF coils during insertion into the subject and translation to the target tissue to be imaged, and wherein the housing is constructed of material to automatically expand the plurality RF coils when the compression force is removed, and further, that the sheath has a shaft that exceeds a distance from an insertion point to the target tissue to be imaged (col. 15, lines 66-67; col. 16, 1-37). Atalar et al. '980 also teaches utilizing nitinol bars for attaching the plurality RF coils thereto such that a first RF coil is connected to the first pair of bars and a second RF coil is connected to the second pair of bars (col. 14, lines 57-60). Atalar et al. '980 further teaches that the first pair of bars is located in a first plane and the second pair of bars is located in a second plane (fig. 6D). Atalar et al. '980 further teaches that the first and second planes are perpendicular to each other (fig. 4A). Atalar et al. '980 also teaches a gap formed between the plurality of RF coils and the housing is configured to increase RF sensitivity away from the probe (col. 13, lines 66-67; col. 14, lines 1-11). Atalar et al. '980 also teaches that the catheter allows blood to pass across the expanded catheter (col. 3, lines 55-67; col. 4, lines 1-5).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Atalar et al. '980 in view of Dumolin (PGPub. No. 2003/0120146).

Atalar et al. '980 teaches all the limitations of the claimed invention including tracking the probe (col. 10, lines 30-45), however Atalar et al. '980 does not expressly teach the probe further comprising a tracking coil configured to actively track probe movement during MR imaging.

Dumolin '146 teaches a method and system for tracking small coils using magnetic resonance and tracking coils (0016).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the probe of Atalar et al. '980 with the use of a tracking coil as taught by Dumolin '146. The motivation to modify Atalar et al. '980 with Dumolin '146 would have been to provide the method with accurate readings of position or orientation of the probe throughout the procedure.

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5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Atalar et al. '980 in view of Dumolin '146 as applied to claim 2 above, and further in view of Foxall (U.S. Patent No. 6,516,210).

Atalar et al. '980 in view of Dumolin '146 teaches all the limitations of the claimed invention except for expressly teaching that the tracking coil is configured to transmit tracking signals for gating data acquisition.

In the same field of endeavor, Foxall '210 teaches using MRI navigator echos during imaging of a patient with a motion detection means that process each navigator echo to gate images obtained from the MRI scanner (col. 3, lines 39-49).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have modified Atalar et al. '980 in view of Dumolin '146 with the motion gated acquisition as taught by Foxall '210. The motivation to modify Atalar et al. '980 in view of Dumolin '146 with Foxall '210 would have been to prevent excessive redundancy of frames corresponding to the same anatomical position.

6. Claims 17, and 19-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Atalar et al. '980 in view of Dumolin '146.

Atalar et al '980 teaches a magnetic resonance imaging system having a plurality of gradient coils positioned about a bore of a magnet to impress a polarizing magnetic field and an RF transceiver system and an RF switch controlled by a pulse module to transmit RF signals to an RF coil assembly to acquire MR images (col. 1, lines 36-53),

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the RF coil assembly comprising: an intra-cardiac catheter configured for insertion into a blood flow (col. 3, lines 55-67; col. 4, lines 1-5) and constructed to automatically expand to an expanded position from a compressed position (col. 15, lines 66-67; col. 16, 1-37); a plurality of RF coils connected to the catheter and configured to acquire MR data (col. 6, lines 37-43); and tracking the coils connected to the catheter to indicate RF coil assembly location and movement within an imaging subject (col. 10, lines 30-41). Atalar et al. '980 also teaches that the catheter expands to substantially match an inner diameter of a target tissue in which the probe is placed (col. 6, lines 6-15). Atalar et al. '980 also teaches allowing fluid flow vectors to pass through the catheter (col. 3, lines 55-67; col. 4, lines 1-5). Atalar et al. '980 also teaches that the plurality of RF coils includes a first RF coil and a second RF coil (fig. 6, refs. 607A, 607B). Atalar et al. '980 further teaches that the catheter includes a first set of bars attached to the first RF coil and a second set of bars attached to the second RF coil (col. 14, lines 57-60). Atalar et al. '980 also teaches a sheath configured to receive the RF coil assembly therein for insertion into an imaging subject (col. 3, lines 66-67; col. 4, lines 1-5; col. 14, lines 46-53). Atalar further teaches that the catheter is configured to auto-expand upon sheath retraction from the RF coil assembly (col. 14, lines 57-62; col. 16, lines 29-31). Atalar et al. '980 further teaches that the catheter is constructed of a memory-type material (col. 14, lines 57-60).

Atalar et al. '980 does not expressly teach using a tracking coil.

Dumolin '146 teaches a method and system for tracking small coils using magnetic resonance and tracking coils (0016).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Atalar et al. '980 with the use of a tracking coil as taught by Dumolin '146. The motivation to modify Atalar et al. '980 with Dumolin '146 would have been to provide the method with accurate readings of position or orientation of the coil throughout the procedure.

7. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Atalar et al. '980 in view of Dumolin '146 as applied to claim 17 above, and further in view of Foxall '210.

Atalar et al. '980 in view of Dumolin '146 teaches all the limitations of the claimed invention except for expressly teaching that the tracking coil is configured to transmit signals to facilitate MR data acquisition gating.

In the same field of endeavor, Foxall '210 teaches using MRI navigator echos during imaging of a patient with a motion detection means that process each navigator echo to gate images obtained from the MRI scanner (col. 3, lines 39-49).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Atalar et al. '980 in view of Dumolin '146 with the motion gated acquisition as taught by Foxall '210. The motivation to modify Atalar et al. '980 in view of Dumolin '146 with Foxall '210 would have been to prevent excessive redundancy of frames corresponding to the same anatomical position.

8. Claims 26, 27, 28, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Atalar et al. '980 in view of Dumolin (PGPub. No. 2003/0120146).

Atalar et al. '980 teaches a method of using an MR imaging device, the method comprising: inserting an intracardiac MR imaging device into a sheath configured for insertion into an imaging subject to be scanned (col. 3, lines 66-67; col. 4, lines 1-5; col. 14, lines 46-53), the imaging device comprising a pair of RF coils attached to an auto-expandable former (col. 14, lines 57-60; col. 14, lines 57-62; col. 16, lines 29-31); positioning the imaging device within the imaging subject to be scanned (col. 3, lines 55-67; col. 4, lines 1-5); and retracting the sheath to allow the former to automatically expand the pair of RF coils to an expanded position (col. 14, lines 57-62; col. 16, lines 29-31). Atalar et al. '980 also teaches that the former is constructed to allow fluid subflow passage therethrough (col. 3, lines 55-67; col. 4, lines 1-5). Atalar et al. '980 also teaches actively tracking movement of the imaging device during image scanning to monitor movement of the imaging device (col. 10, lines 30-45). Atalar et al. '980 also teaches using an auto-expandable former compressed within the sheath while navigating to a target anatomy (col. 3, lines 66-67; col. 4, lines 1-5; col. 14, lines 46-53).

Atalar et al. '980 teaches tracking the coil (col. 10, lines 30-45), however does not expressly teach using a tracking coil.

Dumolin '146 teaches a method and system for tracking small coils using magnetic resonance and tracking coils (0016).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Atalar et al. '980 with the use of a tracking coil as

taught by Dumolin '146. The motivation to modify Atalar et al. '980 with Dumolin '146 would have been to provide the method with accurate readings of position or orientation of the coil throughout the procedure.

9. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Atalar et al. '980 in view of Dumolin '146 as applied to claim 28 above, and further in view of Foxall '210.

Atalar et al. '980 in view of Dumolin '146 teaches all the limitations of the claimed invention except for express teaching gating data acquisition to reduce imaging artifacts.

In the same field of endeavor, Foxall '210 teaches using MRI navigator echos during imaging of a patient with a motion detection means that process each navigator echo to gate images obtained from the MRI scanner (abstract; col. 3, lines 39-49).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Atalar et al. '980 in view of Dumolin '146 with the motion gated acquisition as taught by Foxall '210. The motivation to modify Atalar et al. '980 in view of Dumolin '146 with Foxall '210 would have been to prevent excessive redundancy of frames corresponding to the same anatomical position and to compensate for patient motion.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ellsworth Weatherby whose telephone number is (571) 272-2248. The examiner can normally be reached on M-F 8:30 a.m. - 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eleni Mantis-Mercader can be reached on (571) 272-4740. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

EW


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